UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,453	11/30/2000	Marco Ebert	00236	9472

23338 7590 04/07/2005

DENNISON, SCHULTZ, DOUGHERTY & MACDONALD
1727 KING STREET
SUITE 105
ALEXANDRIA, VA 22314

EXAMINER	
AFTERGUT, JEFF H	

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/725,453	EBERT ET AL.	
	Examiner	Art Unit	
	Jeff H. Aftergut	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-32 and 34-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-32 and 34-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 24-32 and 34-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent claim 24 recites:

"obtaining an integral fiber preform by tailored fiber placement using continuous fibers laid and stitched to obtain a desired geometry having at least one intersection or node point, and having a substantially constant material thickness and substantially constant fiber volume content at the at least one intersection or node point and adjoining portions of the preform"

however it is not clear how one obtained the "integral fiber perform" having uniformity in thickness and uniformity in fiber volume along the entire length of the same from one end to the other including nodal points or points of intersection using "tailored fiber placement using continuous fibers laid and stitched to obtain a desired geometry". One skilled in the art would not know how to make the specified perform by fiber placement using continuous fibers and stitching (it is assumed based upon the disclosure that the "stitching" applicant is referring to is with a sewing thread). The original disclosure at page 4, lines 17-page 5, line 8 states that tailored fiber placement was used to make the perform (see also page 7, line 20-page 8, line 6), however the original disclosure recites

that the tailored fiber placement entailed the use of sewing thread and stitching repeated layers on top of one another whereby endless fibers were used as the reinforcement. It is not seen how a constant volume (not at least double) and a constant thickness (not at least double) can be obtained by the processing suggested in the original disclosure where continuous, endless fibers were used to make the perform (as conservation of material dictates that at the nodes or points of intersection one skilled in the art would have expected without removing material that the cross over would have had twice as much material (double thickness) and twice as much endless fiber (twice the fiber volume). In the drawing provided by applicant on page 2 of the response dated March 14, 2005, the applicant provided a drawing of one of the nodal points. As the two tows interest at the nodal point, it is not seen how one avoided a doubling in the thickness at the nodal point as well as twice the volume at the nodal point as at the cross over the filaments are continuous. While there may always be four tows, at the cross overs at the nodal points there would have necessarily been a doubling in the thickness in the material applied. Applicant has failed to explain and has failed to provide description as to how tailored fiber placement with stitching resolved this issue. As such, the applicant has failed to teach how one skilled in the art would have made the claimed perform such that it would have had the uniformity in fiber volume and thickness including regions of intersection (or nodes). Previously, the applicant argues that the reference to PCT '932 suggested the necessary operation of "tailored fiber placement" which was described in the specification and evidenced that it was known (and therefore applicant need not describe what is meant by tailored fiber placement

and how one obtained the specific grid arrangement with the same), however applicant is advised that the reference to PCT '932 does not at any point in the context therein incorporate a sewing and/or stitching operation. Stitching with a sewing thread would have obviously added to the fiber volume at the nodes and/or points of intersection of the continuous fibers. Note that there is no explanation as to how the fiber volume of the stitching thread was controlled including the stitching at the nodal points which would have rendered the finished lay down having the specified uniformity in volume and thickness as claimed. It is not clear from the disclosure how one employed both placement of filament and stitching of the same to obtain the grid arrangement which had "at least one intersection or node point, and having a substantially constant material thickness and substantially constant fiber volume content at the at least one intersection or node point and adjoining portions of the perform". Applicant has still failed to teach how one made the claimed invention with the fiber placement operation which included stitching therein. Applicant is advised that merely because PCT '932 suggested fiber placement wherein it might be possible to have continuous fibers disposed in the arrangement recited, the applicant's own disclosure must recite how to perform the same in a manner which would have enabled one skilled in the art to utilize the fiber placement to obtain the grid assembly. Applicant has failed to do the same in that there is no disclosure in PCT '932 of the "stitching" within the meaning of the term defined by applicant and there is no explanation in the disclosure how one can obtain constant volume and thickness in the grid at the nodal points when one added additional fiber material at the node via the stitching operation.

Applicant is additionally advised that it is unclear how one can stitch the continuous fibers of the lay up and not break and/or sever some of the continuous fibers therein during the sewing operation as typically the needle of the sewing operation must be inserted into the fiber material in order to stitch the same. As such it is unclear how one retained continuous filaments in the grid assembly at the nodal points where stitching was performed.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 24, 26-31, 38, and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deckers et al in view of Kam et al and PCT WO 99/22932 optionally further taken with either one of Kawasaki et al or Blad et al '679 for the same reasons as expressed in the Office action dated March 19, 2004 in paragraph number 6 optionally further taken with either one of Schmeal et al or Darrieux.

For purposes of the rejection previously presented, it should be noted that the amended claim language is satisfied by the prior art previously applied for the following reasons: (1) the language of the claim as reciting the formation of a "grid" is met by either one of Deckers or Kam (while the references form the grid as part of a shell arrangement, there is no exclusion of the shell in the claim and additionally there is no requirement that the grid formed by the claim be self supporting as argued by applicant and thus the arguments presented by applicant are not commensurate in scope with the claims); (2) the reference to PCT '932 in its broadest sense can be viewed as a

"stitching" operation while there is not sewing taking place the application of pressure with a compaction roller is a stitching of the layer of fibers upon the surface (when one takes the definition of stitching in its broadest sense), and; (3) the applicant has admitted that the reference to PCT '932 suggested the tailored fiber placement operation as was performed by the claims and the applicant in the response. As such it is deemed that the previous rejection is being maintained. To further evidence that one skilled in the art at the time the invention was made would have incorporated a sewing operation in the fiber placement, the references to either one of Schmeal et al or Darrieux are cited.

Schmeal et al as well as Darrieux suggested that one skilled in the art of fiber placement would have desired to incorporate a mechanical means to secure and retain the fibers in place during the placement operation. More specifically, Schmeal suggested that in order to retain their proper position one skilled in the art at the time the invention was made would have incorporated a stapling operation to pierce the material and ensure that the material was retained in place. The reference to Darrieux suggested that when assembling plural plies of material via fiber placement one skilled in the art would have stitched the layers together in accordance with the embodiments depicted with reference to Figures 12-14. The applicant is advised that in order to ensure that the filaments were retained in their desired position in the operation, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the stitching techniques of Darrieux or Schmeal et al in the operation of forming a grid arrangement with the fiber placement device of PCT '932 (which afforded

one flexibility in the manufacturing operation) in the process of Deckers et al in order to provide for greater flexibility in manufacturing of the grid assembly wherein one skilled in the art would have provided the grid as a perform assembly prior to final curing of the assembly as suggested by Kam et al as such would have provided one with a uniform grid which was useful for molding and laminating to other layers in composite article manufacture. Additionally, to provide for uniformity in thickness and fiber volume at the nodes would have been understood to have been desirable as evidenced by either one of Kawasaki et al or Blad et al '679 and applicant is referred to the previous Office action for a discussion of the same.

5. Claims 25, 32, 34-37 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 4 further taken with Booth for the same reasons as presented in the Office action dated March 19, 2004, paragraph 7.

6. Claims 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 4 further taken with either one of Handermann or Kent et al for the same reasons as presented in the Office action dated March 19, 2004, paragraph 9.

Response to Arguments

7. Applicant's arguments with respect to claims 24-32 and 34-46 have been considered but are moot in view of the new ground(s) of rejection.

The applicant has submitted a response which included an explanation as to how one employed tailored fiber placement as well as stitching in order to form a perform

having the specified uniformity in thickness and volume, however as addressed above, the applicant's own description including the second figure of the response still leads to questions as to how the thickness is not doubled at the nodal point as well as the associated increase in volume at the nodal point. Additionally, there appears to be an increase in fiber volume associated with the stitching in the tailored fiber placement which remains unexplained. It is therefore believed based upon the information in the specification as originally filed that the disclosure failed to provide a suitable means for making and using the invention as now claimed and thus is non-enabled.

As expressed above, this does not resolve the question of enablement as the reference PCT '932 which applicant relies upon for the tailored fiber placement and the ability to obtain uniformity in fiber volume and fiber thickness along the grid assembly including at the nodal points does NOT teach a step of stitching the arrangement. Based on the description as originally filed, it is not seen how one skilled in the art would have utilized tailored fiber placement and stitching to obtain a grid arrangement with the specified fiber volume and thickness. The disclosure does not provide enough information as to the processing performed to enable one skilled in the art to make and/or use the claimed operation to achieve a grid.

Regarding the rejection under 35 USC 103, the applicant is advised that if, in fact, the reference to PCT '932 is the tailored fiber placement which was performed by applicant, then it is deemed to meet the requirements of placing the filaments and stitching the same. However, as expressed above, it would have been obvious to add a stitch and/or other mechanical fastening means with the fiber placement operation in

order to ensure that the material would have stayed in place where it was desired as evidenced by either one of Schmeal or Darrieux. The applicant is advised that one skilled in the art at the time the invention was made would have understood the necessity for retaining the placed fibers in their proper position and would have employed the processing of either one of Schmeal or Darrieux.

Regarding the arguments relating to the use of a self-supporting grid structure, note that the claims at hand do not exclude the use of the grid arrangement as being part of a support for a shell structure or as being attached to a shell. There is nothing in the claim which requires that the grid not be assembled to other components and/or that the structure be self supporting. As such the claims at hand are not commensurate in scope with the applicant's arguments. The applicant is advised that the references to Kam and Deckers suggested a grid formation within the scope of the claims as presented.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koury suggested that it was known to form a grid arrangement with a fiber placement device. The reference forms a free standing isogrid with the fiber placement operation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff H. Aftergut whose telephone number is 571-272-1212. The examiner can normally be reached on Monday-Friday 7:15-345 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on 571-272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeff H. Aftergut
Primary Examiner
Art Unit 1733

JHA
April 3, 2005